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(54) A supplementary feed for animals

(57) A supplementary feed particularly suitable for dogs and cats, comprises meat extract, flavour material obtained from saccharide-amino acid reaction and natural paste. The extent of semi-fluidity of the feed is 600 to 2000 poise (60 to 200 Nsecm⁻²). Medicine may be added to the supplement where desired.

A method of manufacturing a supplementary feed is also disclosed, which method comprises the steps of

hydrolyzing meat material by boiling under pressurized atmosphere, filtering hydrolyzed material, condensing filtrate to obtain a meat extract therefrom, adding thereto saccharide and amino acid, heating and mixture at an elevated temperature for a certain period of time and finally adding natural paste to such an extent that fluidity of the mixture reaches 600 to 2000 poise (60 to 200 Nsecm⁻²).

Suitable pastes are gum arabic, tragacanth gum, pechin, xanthan gum and locust bean gum.

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SPECIFICATION

A supplementary feed for animals

The present invention relates to a supplementary feed for animals and more particularly to a supplementary feed suitable for dogs and cats and usable in combination with conventional dog food and cat food and as a carrier for a medicine as required. 5

In recent years an increasing number of animals, such as dogs and cats are being kept as pets. It is also common to keep dogs as watchdogs or hunting dogs. Typically, foods for such animals have been prepared from waste foods or feed "slushes". However, it has been found that feeding animals only with such waste food or slush does not provide animals with a sufficiently balanced nutrition and may lead to animals becoming overweight or ill. 10

With the foregoing problem in mind it is now common to prepare dog and cat foods to contain ingredients to give an appropriately balanced nutrition. As is well known, dog food or the like may be supplied either in a dried or granular form or in a so-called moisture-type that contain a certain amount of moisture so that the food is appreciably soft. Dog food or the like of the first-mentioned dried granular type is usually fed to an animal with water, milk or the like added thereto, whereas the moisture-type food may be fed to animals without any addition of water, milk or the like. 15

As mentioned above, conventional dog food or the like is manufactured in consideration of providing a well balanced nutrition. Such foods have been recognized as good food for dogs and cats but have a drawback in that the animals tend to lose interest in eating if they are fed with the same food for a long period of time. Further, in recent years it has been found that some dogs and cats exhibit no interest in such foods even on the first occasion that they are fed with it. This may be due to the diversification of the animal's food preferences. In other words there is a tendency for animals not to be satisfied with a food having a single taste and flavouring. 20

It is becoming increasingly common for animals to be kept in a room or to have their movements limited, for example by a chain, within a small area. If animals having such restricted movements are fed with excessively nutritious foods this commonly leads to illness. 25

When animals become ill, medicine is usually administered by a veterinary surgeon. Medicine may be given either through the animals skin structure by injection or may be given orally. In the last-mentioned case medicine is typically given in the form of a tablet, capsule, powder or syrup. However, in practice it is often very difficult to encourage animals to take medicine orally. For this reason medicine is often flavoured with a variety of flavourings in order to encourage the animal to take the medicine. Whilst this is frequently successful some animals still exhibit no interest in the flavoured medicine. In such instances the veterinary surgeon is forced to undertake more difficult procedures to administer the medicine. 30

As dogs and cats become old they tend to lose interest in eating solid foods and therefore a fluid medical food having good digestibility and excellent edibility is required to feed older dogs and cats. 35

It is an object of the present invention to provide supplementary feed for animals which may be used together with a conventional dog food, cat food, slush or the like and which is effective in giving an additional nutritious component to the latter.

Thus, according to one aspect the present invention provides a supplementary feed for animals, which comprises a meat extract, a paste material and a reaction product obtainable from reaction of a saccharide with an amino acid, the degree of fluidity of the feed being in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). 40

According to a second aspect the invention provides a supplementary feed for animals, which comprises a paste material and a reaction product obtainable from reaction of meat extract, a saccharide and amino acid, the degree of fluidity of the feed being in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). 45

According to a third aspect the invention provides a supplementary feed for animals, which comprises a reaction product obtainable from reaction of a meat extract, saccharide, amino acid and a paste material, the degree of fluidity of the feed being in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). 50

Desirably, the meat extract is present in amounts from 5 to 35% by weight.

According to a further aspect the invention provides a supplementary feed for animals, comprising a meat extract in the range of from 5 to 35% by weight, flavour material, obtained from a saccharide—amino acid reaction, in the range of from 0.5 to 8% by weight, and a paste material, and having a degree of semifluidity in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). 55

The meat extract may be prepared from one or more kinds of meat materials selected from a group comprising beef, mutton, pork, poultry meat and fish meat.

The saccharide may be selected from sugar, xylose, ribose, arabinose, galactose, mantose, glucose, maltose, lactose and sucrose, and the amino acid may be selected from tryptophan, histidine, lysine, glycine, alanine, cystine and methionine. 60

Accordingly, it is possible to change the taste and flavouring of a dog feed, slush or the like by covering this with a supplementary feed or mixing the former with the latter to improve or promote appetite.

Since taste and flavouring may be easily changed by changing the material used to prepare the meat extract and for the saccharide-amino acid reaction, the supplementary feed of the invention is readily adaptable to meet the current more diversified preferences of dogs and cats. Further, since the supplement can include such necessary additional components as required to provide a well balanced nutrition it can be assured that animals receive a well balanced diet even when the supplement is used together with conventional unbalanced food for instance, a slush having large amounts of carbohydrate material contained therein.

Another advantageous feature of a feed of the invention is that animals can be encouraged to take a medicine by mixing the medicine with the supplementary feed. Moreover, the supplementary feed of the invention has been found to be readily digestible without any particular burden exerted on internal organs of dogs and cats and thus is particularly useful for feeding sick animals, because it is prepared in the semifluid state.

Accordingly, a further aspect of the invention provides a method of manufacturing a supplementary animal feed having a degree of fluidity of from 600 to 2000 poise (60 to 200 Nsecm⁻²), which comprises admixing a meat extract, a paste material and a reaction product obtained by reacting a saccharide and amino acid.

A still further aspect of the invention provides a method of manufacturing a supplementary animal feed having a degree of fluidity of from 600 to 2000 poise (60 to 200 Nsecm⁻²), which comprises admixing a paste material with a reaction product obtained by reacting a meat extract, saccharide and amino acid.

Another aspect of the invention provides a method of manufacturing a supplementary feed having a degree of fluidity of from 600 to 2000 poise (60 to 200 Nsecm⁻²), which comprises admixing and reacting a meat extract, a paste material, a saccharide and amino acid.

Preferably, the meat extract is obtained by boiling a meat material under a pressurised atmosphere, to hydrolyze the meat material, filtering the hydrolyzed material and condensing the filtrate to obtain the meat extract.

Desirably, the reaction product is obtained by heating the reactants to a temperature in the range of from 90 to 120°C for from 30 to 120 minutes.

In yet another aspect, the invention provides a method of manufacturing a supplementary animal feed, comprising the steps of hydrolyzing a meat material by boiling under pressurized atmosphere, filtering the hydrolyzed material after completion of hydrolyzation, condensing the filtrate to obtain a meat extract, adding saccharide and amino acid to the meat extract, heating the mixture of meat extract, saccharide and amino acid to a temperature in the range of from 90 to 120°C for from 30 to 120 minutes, and adding a paste material to such an extent that the degree of fluidity of the mixture is in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²).

A suitable meat material may constitute a basic raw material for the supplementary feed of the invention. Any kind of meat material may be used, for instance, beef, poultry meat, fish meat, mutton and pork are usable. When the supplementary feed is to be used for feeding a dog, beef, pork and poultry meat are preferable, because a flavour meat suited to the preference of dogs can be obtained using these meats. On the other hand, if the feed is to be used for feeding cats, fish meat is also acceptable in addition to the aforesaid meat materials.

To prepare a feed supplement of the invention such meat material is first boiled under pressurized conditions and hydrolyzed in the presence of a protein decomposition enzyme (a protease). The resultant material is then filtered and the filtrate condensed to obtain a desired meat extract. Meat extract obtained by decomposing meat material in this way has a taste and nutritious material content that relates closely to the taste and nutritious material content of the final supplementary feed. The meat extract is preferably added in amounts from 5 to 35% by weight, represented on the basis of the total weight of the supplementary feed. When the amount of meat extract added is less than 5% by weight, the taste of the supplementary feed becomes light and weak, resulting in reduced edibility and a shortage in nutritious content, whereas when more than 35% by weight of meat extract is added, the taste of the supplementary feed becomes heavy and the cost of the supplementary feed becomes unacceptably high.

The supplementary feed of the invention also contains a flavouring material obtainable from the saccharide-amino acid reaction (the "Maillard" reaction). The flavouring material is effective for stimulating the appetite of dogs and cats. It has been found that a meat based flavour obtainable from beef, pork, mutton, poultry meat and fish meat is most suitable for use in supplementary feed to be used for feeding to dogs and cats. Since dogs and cats are very sensitive to flavour, it is important what flavour is selected.

The saccharide used for producing flavour material obtainable from the saccharide-amino acid reaction may be one or more saccharide selected from a group comprising sugar, glucose, xylose, ribose, arabinose, galactose, mantose, maltose, lactose and sucrose. The amino acid used in the saccharide-amino acid reaction may be one or more amino acid selected from a group comprising tryptophan, histidine, lygine, glycine, alanine, cystine and methionine.

Preferably, flavour material obtainable from saccharide-amino acid reaction is present in the range of from 0.5 to 8% by weight. When present in amounts less than 0.5%, its flavour effect is

adversely reduced, whereas when present in amounts greater than 8%, flavour obtainable from flavour material is undesirably heavy.

In addition to the meat extract discussed above a further extract material may be added to the feed supplement, such further extract hereafter referred to as "other extractive material") may be one or more kinds of extractive material selected from a group comprising bone extractive, gelatine and vegetable based decomposed protein material.

Preferably, such other extractive material is added in the range 1 to 30% by weight. When the amount of addition is less than 1% any additional tasting effect is negligible, whereas when more than 30% by weight of other extractive material is added the taste obtainable from the meat extract is adversely reduced.

Preferably the supplementary feed also includes inorganic salt materials such as table salt (NaCl), ash (including alkali metals such as Na and K, alkali earth metals such as Ca and Mg, and Fe or the like) and others. The inorganic salt material is usually added to the supplementary feed while the meat extract and other extractive material are added thereto. The amount of additional nutritious components such as Ca, Fe and P may be properly increased or decreased depending upon the nutritional requirements of the dog or cat to be fed.

A paste material is added for the purposes of adjusting the degree of fluidity of the supplementary feed. Preferably the paste is added in the presence of water. The paste may be one or more kinds of paste selected from a group comprising gum arabic, tragacanth gum, pectin, xanthane gum and locust bean gum. Any other suitable paste may be used.

As mentioned above the paste material is contained in the supplementary feed for the purpose of adjusting the fluidity thereof. The extent of semifluidity or viscosity is preferably in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). When the viscosity is less than 600 poise (60 Nsecm⁻²), the supplementary feed becomes excessively fluid and thereby tends to be readily deposited on the bottom of a container after mixing with slush, dog food, cat food or medical food particularly when containing medicine in the form of a capsule(s), whereas when the viscosity of the supplement is in excess of 2000 poise (200 Nsecm⁻²), the feed is difficult to mix with slush, dog food, cat food, or medical food and therefore mixing operations cannot easily be performed.

Further, any other nutrition promoting agents such as vitamins or the like may be added to the supplement as required.

In one method of manufacturing a supplementary feed, suitable for feeding to dogs and cats, meat material is first boiled under pressurized conditions and is then hydrolyzed in the presence of a protein decomposing enzyme.

A solution of the resultant material is then filtered and the filtrate condensed to obtain the desired required meat extract.

This meat extract is added with saccharide and amino acid and the mixture of meat extract, saccharide and amino acid is heated to promote reaction between the saccharide and amino acid to produce a flavouring compound. Thereafter, a paste material (in amounts to obtain a desired viscosity), other extractive material, such as beef bone extractive or the like, nutrition promoting agents and one or more kinds of inorganic salt as required are added in the presence of water.

The aforesaid flavour material, obtained from the saccharide-amino acid reaction ("Maillard" reaction), is produced when the saccharide and amino acid are mixed and then heated. Preferably the meat extract, saccharide and amino acid mixture is heated to a temperature in the range of from 90 to 120°C for from 30 to 120 minutes, and more preferably to a temperature of from 95 to 100°C for from 60 to 90 minutes. It has been found that beef-based or fish meat-based flavour material can be obtained by allowing the aforesaid reaction to be carried out under aerobic conditions.

The following Examples further illustrate the present invention.

Example 1

100 parts by weight of beef was first mixed with 200 parts by weight of water and the mixture of beef and water was boiled, in the presence of a protein decomposing enzyme, at a pressure of 0.5 Kg/cm² under an atmosphere of steam to hydrolyze the meat.

After completion of hydrolyzation the resultant material was filtered and the thus obtained filtrate condensed to a concentration of about 60% so that a required beef extract was obtained.

25 parts by weight of the beef extract was added with 10 parts by weight glucose, 3 parts by weight of the amino acid lysine, 27 parts by weight of bone extractive material, 1.5 parts by weight of nutrition promoting agent and 0.5 parts by weight of a locust bean gum paste material and the mixture was well mixed. Thereafter the mixture was subjected to reaction at a temperature in the range of from 95 to 100°C for 70 minutes under aerobic conditions and, after completion of the reaction, an appropriate amount of water was added to obtain 100 parts by weight of the final supplementary feed.

In addition to the above-described auxiliary feed, other feeds were prepared in accordance with the compositions as noted in Table 1.

Table 1

No. of feed supplement

ITEM-All amounts in parts by weight		1	2	3	
5	beef extractive	25	19	12	5
	saccharide (glucose)	10	7	5.4	
	amino acid (lygine)	3	2	1.5	
	paste material (locust bean gum)	0.5	0.5	0.6	
	other extractive material	27	21	15	
10	(bone extract)				10
	nutrition promoting agent	1.5	1.5	1.5	
	water	33	49	64	
total		100	100	100	

Investigations were then carried out using these supplementary feeds to observe how selection was made among feeds by a dog. Specifically, two kinds of feeds were prepared for the same dog and placed in front of him, one of the feeds was a commercial dog food and one the same food but having about 10% of the supplementary feed of the invention added thereto. During observations it was noted which of the foods was selected by the dog.

Several species of dogs were used during this investigation, and each experiment was carried out using one dog from each of species. In each experiment 100 g of each feed was prepared irrespective of the size of dog. It should be noted that a dry type commercial dog food constituting a base feed (containing moisture less than 10%) was employed during this investigation. The dogs were fed at three different times in a day.

The results of this investigation are shown in Table 2. When it was observed that the food with the supplementary feed of the invention added thereto was preferably eaten but the other feed was not eaten at all after the former was manually replaced with the latter, this case is referred to as a case where the supplementary feed had an edibility and it is identified with a double circle mark ⊙ in the table. When it was found that the commercial food alone continued to be eaten after manual replacement of the food containing the supplementary feed, this is identified with a single circle mark ○ in the table. When it was found that no edible response was recognized with the food containing the supplementary feed of the invention added thereto, this case is identified with a cross mark X in the Table.

As will be readily apparent from the table, all of the dogs exhibited edibility towards the food containing the supplementary feed of the invention. Further, this trend was more clearly shown in the smaller dogs than in the larger sized dogs.

Table 2

Feeding time in a day

		Feeding time in a day					
Kind of dog	Male or female	Weight	7.00 am	12.00 pm	5.00 pm		
40	maltese	male	about 10 Kg	⊙	⊙	⊙	40
	"	female	about 13 Kg	⊙	⊙	⊙	
	dachshund	male	about 15 Kg	⊙	⊙	⊙	
	"	female	about 15 Kg	⊙	⊙	⊙	
	shibadog	male	about 18 Kg	⊙	○	⊙	
45	"	female	about 15 Kg	⊙	⊙	⊙	45
	bulldog	male	about 25 Kg	○	○	○	
	"	female	about 25 Kg	○	○	○	
	shepherd dog	male	about 45 Kg	○	○	○	
	"	female	about 40 Kg	○	○	○	

50 Example 2

In this Example the facility of the supplementary feed to induce appetite in dogs was investigated.

It is difficult to determine directly whether or not a dog is hungry. For the purposes of this investigation the degree of hunger was determined by measuring a period of time taken by a dog to consume a given amount of feed. Only the smaller of the dogs used in Example 1 were selected for this investigation.

Experiments were conducted with one dog from each of the breeds. Each experiment comprised the steps of placing a selected one of two kinds of foods, in equal amounts, in front of a dog, one of the foods being a conventional dog feed (the same food as in Example 1) and the other one being a mixture of the commercial dog food and supplementary feed of the invention, and then measuring the period of time required for eating of the food to be completed. 5

50 g of feed was given to each dog, the amount of supplementary feed added being the same as in Example 1. Feeding was effected at 5.00 p.m. Specifically, feeding was effected with the commercial dog food alone on the first day of the experiment and then with the mixture of dog food and the supplementary feed of the invention on the next day.

10 The results of these experiments are shown in Table 3. 10

As will be apparent from the Table, it was found with each of the kinds of foods that the period of time required for completely eating the mixture containing the supplementary feed of the invention was reduced almost to approximately a half of the time observed for the same dog when eating the same amount of a commercial dog food alone. This indicates that a supplementary feed of the invention is very effective for inducing appetite for dogs. 15

Table 3

<i>Kind of dog</i>	<i>Male or female</i>	<i>Weight</i>	<i>Eating time-commercial dog food only</i>	<i>Eating time-plus supplementary feed</i>	
20 maltese	male	about 10 Kg	3 min. 12 sec.	1 min. 50 sec.	20
"	female	about 13 Kg	3 min. 6 sec.	1 min. 35 sec.	
dachshund	male	about 15 Kg	2 min. 40 sec.	1 min. 15 sec.	
"	female	about 15 Kg	2 min. 25 sec.	1 min. 20 sec.	
shibadog	male	about 18 Kg	2 min. 15 sec.	1 min. 10 sec.	
25 "	female	about 15 Kg	2 min. 30 sec.	1 min. 3 sec.	25

Example 3

In this Example experiments were carried out using three groups of dogs, to investigate which one was selected from two kinds of foods when a group of dogs were simultaneously released from the same position and where the two kinds of foods were placed on the ground about 10 m away from the dogs and spaced about 50 cm apart. One of the foods was a commercial (dry type) dog food and the other food was a mixture of a commercial dog food and about 10% of a supplementary feed of the invention. Three groups of dogs were used: Group A comprising female maltese having a weight in the range of 10 to 13 Kg; Group B comprising female shih tzu having a weight in the range of 8 to 10 Kg; and Group C comprising toy poodles having a weight in the range of 5 to 6 Kg. Each of these three groups contained three dogs. 30

35 The results of these experiments are shown in the Table 4. 35

It should be noted that in the Table where all of three dogs rushed towards and ate the mixture food this is identified with a double circle mark ⊙. A case where at least one of the three dogs rushed towards the commercial dog food and ate the same is identified with a cross mark X as it is not clear that the dogs had shown a preference for the commercial dog food. 40

Table 4

<i>Kind of group</i>	<i>Male or female</i>	<i>Weight</i>	<i>Results</i>	
A group	female	10 to 13 Kg	⊙	
45 B group	female	8 to 10 Kg	⊙	45
C group	female	5 to 6 Kg	⊙	

Example 4

In this Example experiments were carried out using a single cat to observe which food was selected from two kinds of foods. One of the foods was a commercial cat food and the other a mixture containing about 10% of a supplementary feed of the invention which was produced by way of the steps mentioned in Example 1. 50

Tests were conducted using one cat from each of a number of breeds of cat and in each case 50 g of each food was given irrespective of size of cat. It should be noted that a dry type commercial cat food constituting a base feed (containing moisture less than 10% therein) was employed for the tests. 55

55 The results of this investigation are shown in Table 5. 55

In the Table the following symbols are used: when it was found that the food with the supplementary feed of the invention added thereto was eaten but the commercial feed was not eaten

at all after the former was manually replaced with the latter, this is referred to as a case where the supplementary feed has edibility and it is identified with a double circle mark ⊙. When it was found that the cat continued to eat the other food when this was substituted for the food containing the supplement this is identified with a single circle mark ○ in the table. If none of the food containing the supplementary food was eaten this is identified with a cross mark X.

As is apparent from the table, a supplementary feed of the invention exhibits excellently high edibility when it is eaten by cat.

Table 5

10	Kind of cat	Male or female	Weight	Time of feeding time			10
				7.00 am	12.00 pm	5.00 pm	
	persian	male	about 7 Kg	⊙	⊙	⊙	
	"	female	about 7 Kg	⊙	⊙	⊙	
	siamese	male	about 4 Kg	⊙	⊙	⊙	
15	"	female	about 5 Kg	⊙	⊙	⊙	15
	chinchilla	male	about 7 Kg	⊙	⊙	⊙	
	"	female	about 7 Kg	⊙	⊙	⊙	

Example 5

In this Example the time taken for a cat to eat a given amount of food was measured in order to indicate whether use of a supplementary feed of the invention increases the appetite of the cat.

Experiments were conducted by selecting one from each of the breeds of cats used in Experiment 4.

Each cat was fed using a different food on consecutive days. The first of these foods was a commercial cat food (the same food as that used in Example 4) and the second was a mixture of commercial cat food having about 10% of a supplementary feed of the invention added thereto. The period of time required for completion of eating the same amount of each food was measured.

20 g of each food was fed to each cat. On the first day of the experiment the cats were fed with the commercial cat food alone and on the next day were fed with the supplementary feed/cat food mixture. On each day feeding was carried out at 5.00 pm.

The results of this investigation are shown in Table 6.

As is apparent from the Table, it was found that feeding of the mixture containing supplementary feed was completed within a period of the time substantially shorter than when feeding commercial cat food only. This is a clear indication that a supplementary feed of the invention is effective in increasing the appetite of cats.

Table 6

35	Kind of cat	Male or female	Weight	Eating time-when eating commercial cat food only	Eating time-when the auxiliary feed is added	35
40	persian	male	about 7 Kg	5 min. 20 sec.	3 min. 30 sec.	40
	"	female	about 7 Kg	5 min. 25 sec.	3 min. 40 sec.	
	siamese	male	about 4 Kg	4 min. 45 sec.	3 min. 55 sec.	
	"	female	about 5 Kg	4 min. 55 sec.	4 min. 5 sec.	

Example 6

In this Example experiments were carried out using three groups of cats to investigate which one was selected from two kinds of foods when a group of cats were simultaneously released from the same position and where the two kinds of foods were placed on the ground about 10 m from the cats and spaced 50 cm apart. One of the foods was a commercial cat food (the same food as that in Example 4) and the other food was a mixture of a commercial cat food having about 10% of a supplementary feed of the invention added thereto. Three groups of cats were used: Group A comprising female persian cats having a weight in the range of 7 to 8 Kg; Group B comprising female siamese cats having a weight in the range of 7 to 8 Kg; and Group C comprising female chinchilla cats having a weight in the range of 7 to 8 Kg. Each of the groups contained three cats.

The results of these experiments are shown in Table 7.

When it was found that all of the three cats rushed towards and ate the mixture containing the supplementary feed of the invention this case was recognized as a case where they had exhibited a preference for the mixture food and is identified in the table with a double circle mark ⊙. On the other

hand, when it was found that at least one of the three cats rushed towards and ate the commercial cat food this is identified with a cross mark X in the Table, as it was not clear that the cats had exhibited a preference for the commercial cat food.

Table 7

5	Group	Male or female	Weight	Results	5
	A group	female	7 to 8 Kg	⊙	
	B group	female	4 to 5 Kg	⊙	
	C group	female	7 to 8 Kg	⊙	

10 Example 7

As the variety of dog foods available increases preference inevitably involves a degree of individual taste. However, in view of recent trends that show an increase in occurrences of diseases due at least in part to incorrect nourishment, such as diabetes, remedial action involving alteration of diet have been required. However, in practice, it is often difficult to change or replace one dog food with another in a way acceptable to an individual dog. With the foregoing problem in mind, investigations were made to assess whether the changing of food fed to a dog could be easily achieved when using the supplementary feed of the invention. A number of tests were conducted in conformance with the following testing method.

In the tests five dogs normally eating dry type dog food A were fed with another dog food B to which they had exhibited a lower preference than for the said dog food A. In the tests the difference in the dogs response to being fed dog food B mixed with a supplementary feed of the invention (prepared as described in Example 1) and the dog food B without supplementary feed added thereto was observed. The results of these tests are shown in Table 8.

In Table 8 a double circle mark ⊙ represents that dog food was eaten with enthusiasm, a single circle mark ○ indicates that the food was eaten without enthusiasm and a cross mark X indicates that the food was not eaten at all.

Table 8

30	Kind of dog	Weight	Food B with supplementary feed added	Food B without supplementary feed added	30
	maltese (male)	about 7 Kg	⊙	X	
	maltese (female)	about 8 Kg	○	X	
35	shih tzu (male)	about 6 Kg	⊙	X	35
	shih tzu (female)	about 6 Kg	○	X	
40	chihuahua (female)	about 4 Kg	○	X	40

As is apparent from Table 8, none of the dogs would eat the dog food without the supplementary feed added but all the dogs ate at least some of the Food B when this was mixed with a supplementary feed added thereto although some differences in the amount of eating were recognized. Accordingly, it was found that addition of a supplementary feed of the invention made it possible to change a dog's food from one kind to another food that would previously not be eaten by the dog.

Example 8

100 parts by weight of beef was first mixed with 200 parts by weight of water and the mixture of beef and water was boiled, in the presence of a protein decomposing enzyme, under a pressurized atmosphere of steam to hydrolyze the meat. After completion of hydrolyzation the resultant material was filtered and the thus obtained filtrate condensed to a concentration of about 60% so that a required beef extract was obtained.

25 parts by weight of the beef extract was added with 10 parts by weight of glucose, 3 parts by weight of lygine, 27 parts by weight of bone extractive material, 1.5 parts of nutrition promoting agent and 0.5 parts by weight of a locust bean gum paste and the mixture was well mixed. Thereafter the mixture was subjected to reaction at a temperature in the range of 95 to 100°C for 70 minutes under aerobic conditions and after completion of reaction an appropriate amount of water was added to obtain 100 parts of the final supplementary feed.

The supplementary feed was then mixed with a medicine which may be in the form of a tablet, capsule, powder or flour, and experimental tests were then carried out to observe whether or not said medicine would be taken by a dog.

40 dogs to be tested were divided into four groups each comprising 10 dogs. Of these four groups one group was given medicine in the form of a tablet added to supplementary feed, a second group was given medicine in the form of a capsule added to supplementary feed, a third group was given medicine in the form of powder added to supplementary feed and a fourth group was given medicine in the form of flour added to supplementary feed. It is generally found that there are few problems involved with giving animals medicine in the form of syrup, and so a group given medicine in the form of syrup added to supplementary feed was neglected from the scope of these tests.

The results of these tests are shown in Table 9. In the Table the results are given as the number of dogs which exhibited the response indicated/the number of dogs to be tested.

		Table 9			
		Supplementary feed added to medicine		No supplementary feed added to medicine	
15	Form of addition of medicine	dogs ate food	dogs did not eat	dogs ate food	dogs did not eat
20	tablet	6/10	4/10	0/10	10/10
	capsule	7/10	3/10	0/10	10/10
	powder	10/10	0/10	0/10	10/10
	flour	10/10	0/10	0/10	10/10

As will be apparent from the Table, medicine given in powder and flour form mixed with the supplementary feed of the invention was successfully taken by 100% of dogs tested. Medicine in the form of tablets mixed with supplement was taken by 60% of dogs, and medicine in the form of capsules mixed with supplement was taken by 70% of dogs. Thus medicine in the form of tablets and capsules failed to be taken by 100% of the dogs tested. It is presumed that this is attributable to the fact that the dogs felt the existence of foreign material or a like abnormality in the food. In fact, dogs were observed to eat only the supplementary feed of the invention located around the tablets or capsules and the latter were spat out. Thus, it is considered that the dogs dislike the taste of the medicine itself.

Example 9

A medical supplementary feed produced in accordance with the steps as described in Example 9 was given to dogs in a fluid form.

It is to be noted that a medical supplementary feed of the invention can be prepared to contain sufficient nutritious matter therein for animals requirements and thus is recommendable for use as a fluid food.

Five dogs were selected from a group of dogs which exhibited a lack of appetite, due to increased age or other reasons, and the dogs were not fed for three days. Thereafter, a medical supplementary feed of the invention was given to each dog. Experiments were conducted with three types of medical supplementary feed in the form of fluid food, that is, medical supplementary feed alone, supplementary feed diluted in two times its volume of water and supplementary feed diluted in three times its volume of water.

The results of these experiments are shown in Table 10. In the Table a double circle mark ⊙ designates a case where positive eating was recognized visually, whereas a cross mark X indicates a case where no eating was observed.

		Table 10			
		Medical supplementary feed with 2 times volume of water added	Medical supplementary feed with 3 times volume of water added	Conventional dog food	
50	Kind of dog	Medical supplementary feed alone			50
55	pomeranian	⊙	⊙	X	55
	maltese	⊙	⊙	X	
	chihuahua	⊙	⊙	X	
	poodle	⊙	⊙	X	
	yorkshire terrier	⊙	⊙	X	

As is apparent from the Table, it has been found that a medical supplementary feed of the invention is effective as food for medical treatment at a time when appetite decreases. Thus, the supplement may be very useful as food for medical treatment after completion of a surgical operation.

Claims

- 5 1. A supplementary feed for animals, which comprises a meat extract, a paste material and a reaction product obtainable from reaction of a saccharide with an amino acid, the degree of fluidity of the feed being in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). 5
2. A supplementary feed for animals, which comprises a paste material and a reaction product obtainable from reaction of meat extract, a saccharide and amino acid, the degree of fluidity of the feed
- 10 10 being in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). 10
3. A supplementary feed for animals, which comprises a reaction product obtainable from reaction of a meat extract, saccharide, amino acid and a paste material, the degree of fluidity of the feed being in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²).
4. A feed according to claim 1, 2 or 3, wherein said meat extract is present in amounts from 5 to
- 15 15 35% by weight. 15
5. A supplementary feed for animals, comprising a meat extract in the range of from 5 to 35% by weight, flavour material, obtained from a saccharide-amino acid reaction, in the range of from 0.5 to 8% by weight, and a paste material, and having a degree of semifluidity in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²).
- 20 20 6. A feed according to any one of claims 1 to 5, wherein said meat extract is produced from one or more kinds of meat materials selected from a group comprising beef, mutton, pork, poultry meat and fish meat. 20
7. A feed according to any one of claims 1 to 6, wherein one or more saccharides selected from sugar, xylose, ribose, arabinose, galactose, mantose, glucose, maltose, lactose and sucrose are used in
- 25 25 said reaction for obtaining flavour material. 25
8. A feed according to any one of claims 1 to 7, wherein one or more amino acids selected from tryptophan, histidine, lysine, glycine, alanine, cystine and methionine are used in said reaction for obtaining flavour material.
9. A feed according to any one of claims 1 to 8, wherein said paste material is one or more paste
- 30 30 selected from gum arabic, tragacanth gum, pectin, xanthane gum and locust bean gum. 30
10. A feed according to any one of claims 1 to 9, further comprising another extractive material selected from bone extract, gelatine and vegetable based protein material.
11. A feed according to claim 10, wherein said other extractive material is added in the range of
- 35 35 from 1 to 30% by weight. 35
12. A feed according to any one of claims 1 to 11, further comprising an inorganic salt.
13. A feed according to any one of claims 1 to 12, wherein said supplementary feed is added
- with an amount of medicine in the form of a tablet, capsule, powder or flour.
14. A method of manufacturing a supplementary animal feed having a degree of fluidity of from
- 40 40 600 to 2000 poise (60 to 200 Nsecm⁻²), which comprises admixing a meat extract, a paste material and a reaction product obtained by reacting a saccharide and amino acid. 40
15. A method of manufacturing a supplementary animal feed having a degree of fluidity of from 600 to 2000 poise (60 to 200 Nsecm⁻²), which comprises admixing a paste material with a reaction product obtained by reacting a meat extract, saccharide and amino acid.
16. A method of manufacturing a supplementary feed having a degree of fluidity of from 600 to
- 45 45 2000 poise (60 to 200 Nsecm⁻²), which comprises admixing and reacting a meat extract, a paste material a saccharide and amino acid. 45
17. A method according to claim 14, 15 or 16, wherein the meat extract is obtained by boiling a meat material under a pressurised atmosphere, to hydrolyze the meat material, filtering the hydrolyzed material and condensing the filtrate to obtain the meat extract.
- 50 50 18. A method according to any one of claims 14 to 17, wherein the reaction product is obtained by heating the reactants to a temperature in the range of from 90 to 120°C for from 30 to 120 minutes. 50
19. A method of manufacturing a supplementary animal feed, comprising the steps of
- 55 55 hydrolyzing a meat material by boiling under pressurized atmosphere, filtering the hydrolyzed material after completion of hydrolyzation, condensing the filtrate to obtain a meat extract, adding saccharide and amino acid to the meat extract, heating the mixture of meat extract, saccharide and amino acid to a temperature in the range of from 90 to 120°C for from 30 to 120 minutes, and adding a paste material to such an extent that the degree of fluidity of the mixture is in the range of from 600 to 2000 poise (60 to 200 Nsecm⁻²). 55
- 60 60 20. A method according to any one of claims 14 to 19, wherein the meat extract is produced from one or more meat materials selected from beef, mutton, pork, poultry meat and fish. 60
21. A method according to any one of claims 14 to 20, wherein one or more saccharides selected from sugar, xylose, ribose, arabinose, galactose, mantose, glucose, maltose, lactose and sucrose are used in said reaction for obtaining flavour material.

22. A method according to any one of claims 14 to 21, wherein one or more amino acids selected from tryptophan, histidine, lysine, alanine, cystine and methionine are used in said reaction for obtaining flavour material.
23. A method according to any one of claims 14 to 22, wherein said paste is one or more pastes
5 selected from gum arabic, tragacanth gum, pectin, xanthane gum and locust bean gum. 5
24. A method according to any one of claims 14 to 22, wherein a medicine in the form of a tablet, capsule, powder or flour is added to the supplementary feed.
25. A method according to any one of claims 14 to 24, wherein the meat is boiled in the presence of a proteinase.
- 10 26. A supplementary feed substantially as herein described with reference to the Examples. 10
27. A method of manufacturing a supplementary feed substantially as herein described with reference to Example 1.
28. A method of manufacturing a supplementary feed substantially as herein described with reference to Example 8.
- 15 29. Any novel feature or combination of features described herein. 15